High-performance, flexible partitioning and mission-critical availability for database, ERP and server consolidation

IBM System x3950

Highlights

- ***Delivers breakthrough performance with 64-bit memory addressability through IBM X3 Architecture, the third generation of IBM Enterprise X-Architecture™***
- ***Supports high-performance, dual-core 64-bit Intel® Xeon® Processors MP, and runs 32- and 64-bit applications simultaneously providing headroom and investment protection***
- ***Features IBM XpandOnDemand™ scalability, allowing you to pay as you grow with high-performance, 64-bit Intel Xeon Processors MP up to 32 processors***
- ***Leverages years of IBM virtualization and partitioning expertise and the enterprise-proven reliability of IBM mainframe servers***

The IBM System x3950 is built on IBM X3 Architecture that delivers mainframe-inspired enhancements to the high-performance x86 server industry. With a balanced focus on providing breakthrough 64-bit performance and high availability, the x3950 is designed for the changing business needs of enterprise customers—at a low entry price point.

This flagship System x™ server introduces improved modularity and partitioning with its 3U, 4 CPU, 6 I/O slot modular building-block design. Starting with a base two-processor configuration, add CPU, I/O and memory capacity incrementally as your business needs change, scaling up to 32 processors across eight chassis. Take advantage of the configuration flexibility of the x3950 to build the optimal system for scale-up database and Enterprise Resource Planning or scale-out virtualization for server consolidation.

Get it now

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With X3 Architecture, IBM asserts its leadership position in the 8- to 64-processor[1] server industry to deliver a breakthrough x86 server. The x3950 delivers an unprecedented combination for an industry-standard server—pay-as-you-grow scalability, 64-bit memory addressability, mainframe-inspired latency reductions and advanced availability technologies, all at a price less expensive than comparably performing RISC/UNIX® systems.

Improved XpandOnDemand modularity

The x3950 offers pay-as-you-grow modular scalability to meet the diverse needs of today's mission-critical applications. Using the same 3U chassis (x460) introduced with the single-core, Intel Xeon Processor MP in June 2005, this updated server maintains your data center rack space footprint and preserves compatibility with most optional server components. The flexibility to grow an x3950 into a larger SMP configuration helps IT administrators in the following ways:

- *Leverage the industry's leading x86 server available from a major vendor that scales greater than four processors with 64-bit Intel Xeon Processors MP*
- *Scale up to 32 processors for better performance with dual-core technology*
- *With each four CPU addition, six PCI-X 2.0 slots and up to 16 DIMM slots are also available*
- *Improve utilization with more flexible, chassis-based partitioning up to eight x3950 chassis connected for SMP or arranged into multiple 4-processor, 8-processor and 16-processor partitions*
- *Maximum configuration for the x3950 is 32 processors, 128 DIMM slots supporting up to 512GB of memory and 48 PCI-X 2.0 slots across eight chassis*

XpandOnDemand provides a route to higher performance on Microsoft® Windows® or Linux® using industry-standard hardware. Each x3950 can scale from two processors to four processors in a single chassis (expanding beyond four processors requires one or more 3U x3950E enclosures with matching processors). Grow to eight processors simply by connecting two 4-processor chassis, up to 16 processors in four chassis, or up to 32 processors by connecting eight chassis. This enables the addition of CPU, I/O and memory capacity as your needs change to conform to the demanding requirements of business-critical transaction workloads like virtualization, enterprise resource planning, customer relationship management and database applications.

Breakthrough x86 performance

The x3950 establishes a new standard for industry-leading x86 performance by intelligently managing frequently accessed data. With its mainframe-inspired snoop filter integrated in the processor/memory controller, the x3950 intelligently tracks data stored across the dual front-side bus inside the on-chip Intel processor caches. An IBM developed 48Mb embedded DRAM serves as a cache directory and improves overall performance by minimizing bus congestion and reducing latency compared to competing x86 designs. In a multi-chassis deployment, XceL4v™ Dynamic Server Cache allows the x3950 to exploit up to 256MB of local memory configured as virtual Level 4 cache per four CPUs to mimimize NUMA latencies.

The x3950 supports 64-bit extensions, turning this x86 server into a data powerhouse ready for the transition to mainstream 64-bit applications from proprietary RISC/UNIX servers. The x3950 supports up to 512GB of total memory to load entire databases into main memory for extremely fast transaction processing.

Availability without compromise

The x3950 also delivers the high availability that mission-critical workloads require with a memory subsystem that provides outstanding defenses against downtime. IBM Active Memory™ offers outstanding availability features that are OS independent for maximum flexibility, including:

- *IBM Chipkill™ memory, allowing correction of multiple, single-bit errors using off-the-shelf DIMMs*
- *IBM Memory ProteXion™, keeping the server running by rerouting data in the event of an on-DIMM chip failure to enhance the effectiveness of Chipkill technology*
- *Memory Mirroring, protecting data by writing simultaneously to independent redundant memory cards*
- *Hot-swap and hot-add memory as supported by Microsoft Windows Server™ 2003*

The x3950 also comes with IBM Director software, an outstanding suite of proactive server tools, and the integrated Remote Supervisor Adapter II SlimLine, a server within the server that helps to remotely monitor system health and deliver high-speed text and console redirect. These combined capabilities power virtual 24x7 operations with IBM Predictive Failure Analysis® to monitor critical components and trigger alerts before problems arise.

Enterprise operating system flexibility

The IBM Datacenter Solution Program offers a wide array of technical services for running Microsoft Windows Server 2003 Datacenter x64 Edition up to the maximum 32-processor configuration. Cost-effective Red Hat Enterprise Linux or SUSE Linux Enterprise Server solutions provide reliable enterprise operating systems that help support the constant uptime required by today's data center.

New economies for investment protection

Many of the integrated features and innovations offered in the x3950 also help deliver investment protection by making organizations ready for the next evolution in enterprise server technologies—the migration to 64-bit applications on industry-standard x86 hardware. Supporting cutting-edge dual-core processors, the x3950 features IBM Calibrated Vectored Cooling, which helps keep internal components cool for optimum performance and greater longevity. The x3950 also helps protect the value of your software investment with a framework that supports new 64-bit enterprise applications along with 32-bit legacy applications and system tools. And the x3950 features Active™ PCI-X 2.0 with up to 266 MHz bandwidth per slot, the new standard for high-performance server I/O that also preserves compatibility with the existing install base of PCI and PCI-X 1.0 adapters.

On demand ready

IBM System x servers are guided by the IBM Systems agenda that outlines an IT environment based on simplification and optimization. The IBM Systems agenda is based on these fundamental principles:

- *Virtualization—By automating, optimizing and simplifying complex infrastructures, businesses can build more resilient, manageable and cost-effective systems.*
- *Openness—By supporting and advancing open standards, enterprises can protect their IT investments both now and in the future.*
- *Collaboration for innovation—By enabling information on demand, companies can more easily collaborate with business partners, independent solution vendors and clients, helping them drive industry collaboration and provide better service.*

The overall result: a more secure and resilient IT environment.

x3950 at a glance

Form factor/height	Rack/3U per chassis
Processor (max)	Intel Xeon Processor MP up to 3.30 GHz (dual-core)/667 MHz front-side bus
Number of processors (std/max)	2/4 per chassis, 32 per configuration
Cache (max)	Up to 2x2MB L2 and up to 16MB L3
Memory[2] (std/max)	2GB or 4GB/64GB PC2-3200 DDR II per chassis, 512GB maximum
Disk bays (total/hot-swap)	6/6 (per chassis) 2.5" Serial Attached SCSI (SAS)
Maximum internal storage[2, 3]	440.4GB SAS per chassis (supports 36.4GB and 73.4GB hard disk drives)
I/O slots (total/hot-swap)	6/6 (per chassis) Active PCI-X 2.0, all slots supporting up to 266 MHz
Network interface	Integrated dual Gigabit Ethernet
Power supply (std/max)	1300W 220V 2/2
Hot-swap components	Power supplies, fans, memory, HDDs and PCI-X adapters
RAID support	Integrated RAID-0, -1, -5 (model dependent)
Systems management	Alert on LAN™ 2, Automatic Server Restart, IBM Director, IBM ServerGuide™, Remote Supervisor Adapter II SlimLine, light path diagnostics (independently powered), Predictive Failure Analysis on hard disk drives, processors, VRMs, fans and memory, Wake on LAN®
Operating systems supported	Microsoft Windows Server 2003 (Standard, Enterprise and Datacenter editions 32-bit and 64-bit), 32- and 64-bit Red Hat Enterprise Linux and SUSE Enterprise Linux, Microsoft Windows 2000 (Server and Advanced Server), VMware ESX Server
Limited warranty[4]	3-year onsite limited warranty

For more information

World Wide Web

U.S.	**ibm.com**/systems/x
Canada	**ibm.com**/ca/en/systems/x

Reseller locator

U.S.	1 800 426-4968
Canada	1 800 426-2255

[1] IDC, 3Q 2005, IDC Server Tracker

[2] Maximum internal hard disk and memory capacities may require the replacement of any standard hard drives and/or memory and the population of all hard disk bays and memory slots with the largest currently supported drives available. When referring to variable speed CD-ROMs, CD-Rs, CD-RWs and DVDs, actual playback speed will vary and is often less than the maximum possible.

[3] When referring to storage capacity, GB =1,000,000,000 bytes. Accessible capacity is less.

[4] IBM hardware products are made from new parts, or new and serviceable used parts. Regardless, our warranty terms apply. For a copy of applicable product warranties, write to: Warranty Information, P.O. Box 12195, RTP, NC 27709, Attn: Dept. JDJA/B203. IBM makes no representation or warranty regarding third-party products or services including those designated as ServerProven® or ClusterProven®.

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Route 100
Somers, NY 10589

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